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AUTHOR Roe, Mary F.
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ABSTRACT

This research probes the content and consequences of the decisions that teachers make while conducting a lesson. Subjects included 2 middle school teachers (grades 7 and 8) and 35 of their students. This research employed participant observation, informant interviewing, and shared viewing of a videotaped lesson to explore interactive decision making. Analysis of the data collected resulted in a reconceptualization of interactive decision making as classroom reflection-in-action. The findings created categories of reflective actions for students and teachers, offered reasons for these actions, and explored the consequences. Cumulatively, the findings establish the complexity and ecological nature of classroom reflection-in-action and suggest additional areas for research. Thirty-five references are included. (IAH)

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Interactive Decision Making: A Reconceptualization

Paper presented at the annual meeting of the American Educational Research Association

Chicago, IL

Mary F. Roe

Eastern Washington University

Cheney, WA

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Interactive Decision Making: A Reconceptualization

Introduction

The teaching profession provides ecological evidence of the complex nature of decision-making. Teachers, members of a complex ecology, face unique daily occurrences that require their judgments. Some of these decisions, such as those made in planning a lesson, occur with the student in mind but not present. Others, made while conducting a lesson, involve an interaction between the teacher, the student, and the planned lesson. Often, the available choices represent equally compelling options. Thus, for teachers, these daily dilemmas represent a professional challenge. Here I attempt to understand a segment of this complex task--teachers' interactive decisions.

Three areas of scholarship informed my research efforts. First, I explored the general nature of schools. The wider lens taken by other researchers enlightened my understanding of this important area. In the main, I discovered four structural commonalities: (a) grouping practices (e.g. Good & Brophy, 1987; Goodlad, 1984; Oakes, 1985; Sedlak, Wheeler, Pullin & Cusick, 1986), (b) a narrow range of repetitive instructional activities (Goodlad, 1984), (c) an emphasis on student control (McNeil, 1986; Tye, 1985), and (d) the powerlessness of students (Everheart, 1983; Tye, 1985).

Second, I obtained a generalized perspective of the teacher role. One accepted feature of the teacher role is the need for a domain of knowledge (Shulman, 1987; Sizer, 1984; Jackson, 1986). Another is making judgments. Since a teacher's domain of knowledge covers a range of topics, these judgments require cognitive and ideational flexibility (Lanier & Little, 1986). A third trait of the teacher role is uncertainty. (Ashton & Web, 1986;

Landa , 1985, Lortie, 1975; Rosenholtz, 1989). A final feature of the teacher role is continual professional growth. As Wigginton (1985) suggests, "The best teachers I know are always actively involved in the process of becoming better teachers" (p. 275).

Third, I investigated decision-making. Teachers make numerous decisions throughout the day (Lortie, 1975). Some estimates place the number as high as 200 per hour (Jackson, 1968). Previous research has focused on a priori decisions, those made while planning a lesson, and those made while conducting lessons, interactive decisions. Due to the focus of my study, I will limit my comments to research concerning interactive decisions or that combined planning and interactive decisions.

Interactive decisions imply the existence of choice, a teacher's commitment to one of the possibilities, and implementation of a specific action (Clark & Peterson, 1986). Clark and Peterson suggest that, on the average, teachers make one interactive decision every two minutes. Britton (1987) sets the number at 101 per lesson. Shavelson (1983), however, does not see interactive decision-making as occurring as frequently. He sets the average at 10 per hour and suggests that teachers consider few alternatives. Regardless of the actual number, interactive decisions affect the flow of the lesson. Therefore, the mere fact that they occur affect instruction. In addition, the unknown quality of what might appear during a lesson and the potential variation of the decisions provide further complications.

Researchers have considered interactive decisions from several outlooks. Some have looked at the gestalt, attempting to designate the types of interactive decisions teachers make (Angulo, 1988; Heck & Williams,

1984; Marland, 1977, 1986.). Others have maintained a specific focus (e.g. Borko, Cone, Russo, & Shavelson; Morine- Dershimer, 1978-79).

Several points emerge across these studies. First, making interactive decisions represents a complex process that invokes a variety of information sources. Second, the environment, the moment-to-moment context, impacts on the making of decisions. This holistic perspective adds to the complexity of the process. Finally, teachers must be open to choice among variety. They must learn to mentally review possibilities and make responsive choices.

This review of what's known about schools, teachers, and decision-making suggested the appropriateness of additional research. As a first step, more descriptive work seems warranted (Fenstermacher, 1980; Shavelson, 1983). A mere listing of types of interactive decisions seems incomplete. More probing seems necessary to understand what contributes to the availability of various options and how certain options get selected. The goal, then, becomes obtaining a complete conceptualization of interactive decision-making--its creation, selection, and use. As noted by Clark and Peterson (1986), "The time seems right for more comprehensive study of the full variety of teachers' thought processes in relationship to teachers' actions and their effects on students" (p. xx). The following questions provide the direction for this research about teachers' interactive decisions:

1. What types of interactive decisions, decisions made during the implementation of a planned lesson, do teachers make in reading and social studies classes?

2. What sources of information do teachers use in making these decisions?

3. What effect do these decisions have on student performance, behavior, and interpretation of the learning environment?

Method

The research questions often suggest an appropriate methodology. My questions probe the content and consequences of the decisions teachers make while conducting a lesson. To maintain a representation of a classroom environment, the information needs to stem from real teachers conducting their classroom lessons over a period of time. An ethnographic approach seems appropriate for gathering this information.

Research Locale

Gardner Middle School, not its real name, in central Illinois provided the setting for this research. Obtaining a middle school perspective seemed appropriate for two reasons. First, as evidenced by a Carnegie Council of Adolescent Development report (1989), researchers have too often ignored studying the middle grades. The study of interactive decisions is no exception. Second, what little research existed about middle school teachers entailed more of a clinical, contrived approach to studying interactive decisions.

Subjects

Two teachers became the focus of this research. One, whom I'll call Ms. Hughes, teaches eighth grade reading and social studies. A second, whom I'll call Ms. Carson, teaches the same subjects to seventh grade students.

Procedures

Three ethnographic procedures formed the basis for data collection: (a) participant observation, (b) interviewing, and (c) shared viewings of videotaped recordings. The participant observation extended over a three month period. I observed each teacher's social studies and reading classes 25 times, resulting in 50 observational periods per teacher and 100 for the project.

Two goals guided the participant observation facet of the research. First, I wanted to achieve as accurate a representation of these teachers' interactive decisions as I could. Therefore, I needed to remain aware of the potential impact my presence could have upon the behavior of teachers and students and take steps to promote the maintenance of usual interaction patterns.

My second goal was to avoid as much as possible slanting my documentation of the classroom proceedings by judging the appropriateness of decisions or actions. An ethnographic researcher cannot disavow beliefs or predilections, but, recognizing them, she or he has a responsibility to control their influence on observations and interpretations.

As the ethnographer, one procedure I followed was taking extensive field notes. At first, I documented the classroom events as fully as possible. As the field work progressed, my focus sometimes narrowed. At times, I concentrated on interactive decisions more directly. At other times, I endeavored to gain a fuller understanding of the student's viewpoint by following one particular student's classroom experience more closely. In general, the field notes often included verbatim accounts. This allowed a thick description of the cultural realities of the classroom and provided

specific accounts of interactive decisions. Changing the focus and perspective of the field note methods helped me achieve my goals--understanding each classroom and the nature and effect of interactive decisions.

In addition to entries of observational data, the field notes often included post observational comments. These comments sometimes suggested questions to ask teachers or students. In addition, the post observational comments afforded time for my reflection regarding the emergence of patterns. This reflection process extended my immersion in the classroom cultures and contributed to my evolving understanding of interactive decision-making.

In a second research role, I tried to create an atmosphere of honesty and trust between myself, the teachers, and their students. The length of stay in the setting provided an opportunity to develop this relationship. I became accepted by the members of each observed environment, and this acceptance contributed to the aggregation of honest and legitimate accounts of interactive decision-making.

Ethnographic interviewing attempts to discover the cultural meanings people hold (Spradley, 1980). I used it to further understand interactive decision-making. The teachers and a representative group of 35 students participated in privately conducted formal and informal interviews. Their responses offered clarification and insights in two areas. First, they extended my understanding of the cultural scene (Spradley, 1980). Second, they helped me identify interactive decisions, the reasons behind them, and their effect.

The teacher interviews proceeded from developing rapport to identifying and understanding interactive decisions. The research

questions provided a direction and focus for these conversations while their classroom events provided a basis for the specific questions we explored. Ms. Carson and Ms. Hughes willingly shared their expertise. Their articulate and reflective explanations of their classroom life greatly enriched my evolving understanding of their interactive decision-making.

Twenty of Ms. Hughes' eighth grade students and 15 of Ms. Carson's seventh grade students participated in interviews conducted towards the end of the field work period. Eight questions, posed verbatim and in the same order, provided the structure for the interview:

1. When you go into your reading or social studies class, what do you expect to do?

2. Do you sometimes do something you didn't plan? How does that happen?

3. What kinds of decisions do you make during your reading or social studies class?

4. What kinds of decisions do you think your teacher makes?

5. How do you decide when to ask for the teacher's help? What does she do to help you?

6. If you had complete control over what you'd do in reading or social studies class, what would you do?

7. What do you think is the best decision you've made during class? The worst?

8. What kinds of things does a teacher do to get you to work your hardest?

When necessary, I used two techniques to encourage student responses: (a) rephrasing questions, or (b) personalizing the question by referencing their classroom activities. Answers to these questions satisfied

several research goals. First, the answers helped distinguish their interactive decisions from their plans for classroom behavior. Second, they offered the students' characterization of their decision-making opportunities. Third, they provided a judgment from the students' perspective regarding the quality of their decisions. Finally, they provided a way to check whether the teachers' decisions enhanced the students' desires for optimum classroom performance.

Videotape recordings can enhance a conventional ethnography. First, they make it possible to capture and hold episodes that can be described. Second, the equipment's playback features allow scrutiny of an episode in ways not possible with live observation. Finally, they allow the re-examination of particular tape segments (Schaeffer, 1975). These potential benefits seemed particularly applicable to understanding interactive decisions.

For both classrooms, I obtained the equipment and did the taping. The teachers and I mutually agreed upon a taping date. Following the taping event, the teachers and I arranged a time for a shared viewing. The procedures used during this phase resembled Krebs' (1975) film elicitation technique. With this technique, the researcher poses questions in an attempt to discover how the informant structures and interprets the situation being viewed. In this case, I focused on understanding interactive decisions. With their consent, our comments were recorded and later transcribed.

In summary, this research employed participant observation, informant interviewing, and shared viewing of a videotaped lesson. The combined information from these sources contributed to my understanding of interactive decision-making.

Results

Initially, I defined an interactive decision in the tradition of previous research--the selection and implementation of a specific action by a teacher during the implementation of a planned lesson (i.e. Clark & Peterson, 1986). My experience has prompted me to reform and expand that initial understanding. First, I found that students have a profound influence on decision making. So, I have had to include the reciprocal contributions of students and teachers to an interactive decision. My noting "interaction" includes outright communicative interactions. This perspective extends the parameters for studying interactive decisions and it alters their definition. Rather than remaining a singular function of a teacher, interactive decisions account for both teachers and students in a classroom setting.

Second, the term interactive decision-making seems ambiguous. It leaves the nature of the interaction unspecified. Instead, it suggests several possibilities which would significantly alter one's conceptualization of the process. For example, the interaction could suggest a private consultation of a teacher or student with various personal choices, an interplay between classroom members, a redirection of a planned lesson, or an amalgamation of these possibilities. Therefore, searching for a less ambiguous term seemed like a reasonable venture.

In addition, the use of the phrase decision-making suggests a certainty to the process not found in real life. Teachers operate from a knowledge base, but its use seldom offers clear, definitive, expressible procedures. Options are often equally compelling. Selecting one over

another leaves teachers to wonder, as Ms. Hughes does, "Am I hurting them or am I really helping them?"

Therefore, instead of representing decisions stemming from ill-defined interactions, judgments made by teachers and students seem to resemble Schon's (1987) notion of reflection-in-action--a process that, in this case, invokes various information sources, including knowledge of past events and oneself. These classroom judgments stem more from reflections by students and teachers as the lesson progresses than they do from any precise decision mechanisms. An event does not cause a response, but rather triggers rapid, but reflective, thought. These reflective classroom judgments represent classroom events in which students and teachers are inextricably entwined.

For these reasons, I suggest that this study explores classroom reflection-in-action, a process involving students and teachers as they instantiate a classroom plan.

Types of Reflections

The teachers

Describing teacher reflections separately from those of students represents a split of reporting convenience rather than reality. The teacher remains the arbitrator of the incoming information but does not independently initiate a private reflection. In other words, as instances of reflection-in-action occur in the classroom, teachers reflect, although perhaps fleetingly, and select a response.

Ms. Hughes and Ms. Carson enter their classrooms with an agenda. One part of this agenda is their instructional intentions. A second part of the agenda includes their beliefs, attitudes, and dispositions towards their

students, subject matter, and the act of teaching. School expectations and obligations constitute a third agenda component. This agenda provides a framework and sets parameters for teacher reflections during a lesson.

Ms. Hughes and Ms. Carson engage in several types of reflective thinking related to their planned lessons. First, they modify planned events. For example, they might change the depth or direction of the content, insert anecdotes, share personal experiences, or reference current events. In essence, a teacher's ongoing reflection about a plan as it progresses allows a personalization of the preordained events. Rather than formalizing a lesson and implementing it, teachers draw upon various options to create an ecologically appropriate presentation. The characteristics of the lesson and reactions of the students trigger the teacher's reflective thought. The teachers' repertoire of lesson addenda, in this case making lesson changes or inserting information from the world or their lives, affords options. Their reflection results in a unique lesson, unplanned and unrehearsed, the product of reflection-in-action.

Second, these teachers eliminate or discontinue a plan and institute a new one. For example, during her reading class Ms. Hughes changes the activity and grouping pattern, creating a new plan. After showing a film to a previous class, Ms. Carson decides it's not "a strong film" and doesn't show it to the next class.

Third, these teachers use a plan sooner than expected. Ms. Hughes distributes a worksheet to her reading class saying, "I had planned to do it tomorrow, but I (will use it) a day in advance." Ms. Carson shows a section of videotape scheduled for the next day when she notices the students are "totally engrossed."

When teachers decide to change, omit, or use a plan sooner than expected, their decisions impact the entire class. At other times, they personalize a plan. In other words, they take steps to enable a student to comply with an existing plan. Ms. Hughes' and Ms. Carson's personalized responses take three directions.

First, these teachers offer suggestions. This represents a modest form of scaffolding. They suggest strategies, references or a tactic that one of Ms. Hughes' students calls "playing hangman," saying, "The word I'm looking for..." and writing L_ _ on the board.

Second, these teachers rephrase or clarify an initial explanation. Sometimes this involves defining a word used in the explanation. Others require a recasting of an explanation and require more time.

Third, these teachers personalize a plan by telling students an answer or directly indicating what to do. For example, when Ms. Carson's social studies students can't find the capital for Yugoslavia, she supplies and spells it. When Lori can't complete her social studies assignment, Ms. Hughes says, "The main problem is right here." She then reads from the text. "That's the problem...Put these as the results."

As shown in Table 1, these teachers use these avenues for personalizing a plan differently in their reading and social studies classes. In these classes, the teachers use the same approaches to personalize a plan but with subject matter and interpersonal differences.

In summary, one component of these teachers reflection-in-action is personalizing a plan. They accomplish this action in three ways: (a) providing suggestions, (b) recasting an original explanation, or (c) telling an answer or specifying what to do. These teachers most often provide

suggestions. Further, the attributes of these suggestions remain constant for each teacher and subject.

In addition, during a planned lesson, these teachers make evaluative decisions. Discussion responses and written work provide opportunities for these evaluations. On each occasion, their judgments require reflective and immediate evaluations.

Finally, these teachers maintain classroom protocol, separating acceptable from unacceptable behavior. For these teachers, an average of two incidents occur during each lesson. This number doubles for Ms. Hughes' low-ability reading class (see Table 2). In general, teachers react to student behaviors which stray from their expectations for a lesson. Therefore, the daily plan helps determine classroom protocol. The teachers apprise students when their behavior doesn't match teacher expectations in various ways.

One type of response is the kind, good humored request. Both teachers use friendly expressions and often dot their requests with the words used in polite conversation.

Second, they use directives. In these instances, the teachers use explicit statements to make specific demands.

Third, these teachers use indirect speech acts to try to correct unacceptable behaviors. For example, Ms. Carson tells her social studies class, "I've already eaten one butterscotch today. Two are my quota." In these instances, teachers have a behavior in mind, but don't specify it for students. They ask students to do something that enables the behavior they want or they make general comments that suggest the need for a behavior change.

Other responses reflect the teachers' unique personalities. In other words, the statements made by one teacher would seem out of character for the other. Ms. Carson tells her reading class, "Feeding time at the zoo is over." Ms. Hughes tells Andy, "I'm going to go upside your head." She tells John he's going to "have his happy hips outside the door."

At times, Ms. Carson and Ms. Hughes use school options for handling disruptions. Gardner Middle School has an In-house School Suspension program (ISS) and an after school detention program. Both teachers use these options.

Finally, these teachers use nonverbal cues. Some are straightforward. For example, Ms. Hughes might stand by a student. Others are more subtle. As Ms. Hughes says, "They'll look at me and see what kind of expression I have on my face, whether I'm pleased or whether I'm frowning and then (if I'm frowning) they're not doing what they're supposed to be doing."

A second set of reflections are independent of the teachers' educational intentions but impact on the flow of events. Ms. Carson and Ms. Hughes adjust the room's environment. They address student needs such as safety concerns, illness, and, most often, student requests to go to the bathroom. Ms. Hughes and Ms. Carson deal with interruptions from other school personnel. Teachers make adjustments for these events. Therefore, they have an indirect influence on the planned lesson.

Some events, which I call red flag occurrences, happen infrequently but get the teacher's immediate attention. For example, during a discussion in Ms. Hughes social studies class Brad uses the word Chinks. "One time out," says Ms. Hughes. She waits for quiet and explains that calling someone a Chink is like calling her a nigger. The next time Brad

talks, he uses the term "foreign person." "Thank you," responds Ms. Hughes.

Designating two classes of decisions, those related and unrelated to academic intentions, and stipulating categories for each, e.g. personalizing a plan or handling interruptions, presents one complexity of teacher reflections--the number and variety of occurrences faced by teachers (see Table 3). Understanding a second complexity requires reassembling the events into the complete classroom ecology. Rather than detailing the classroom events, I will document the occurrence of teacher reflections during segments of a lesson.

During five minutes of a social studies lesson, Ms. Carson decides how to handle an unprepared student, notices and responds to a lack of student involvement, and makes two decisions to insert anecdotal information. She makes four decisions representing three categories within five minutes.

On another day, she twice ponders how much time students need to complete an assignment, personalizes a plan for three students by providing answers to different questions, and suggests a procedure for a fourth student. Ms. Carson makes six decisions belonging to three categories during this five minute period. While three decisions personalize a plan by telling an answer, each involves a different student and a different category of information. The changing attributes of the decisions alters the nature of similarly grouped reflections.

During a reading class, Ms. Hughes personalizes the plan for Tamra by suggesting a procedure. When this doesn't work, she provides an answer. She later returns to Tamra, answering her first question and suggesting a procedure for the second. Interactions with Tamra dominate

this five minute period. The category, personalizing the plan, remains constant. Tamra's questions and Ms. Hughes' responses change. Therefore, reporting that Ms. Hughes makes four decisions about personalizing a plan during a five minute period would provide an overly simplistic representation of the events.

During a five minute segment of a social studies discussion, Ms. Hughes responds to a student question by suggesting a procedure, "check the book." She extends the plan by adding questions to those she selected in advance to guide the discussion, responds to a student's incorrect answer, and controls a student's attempt to digress. Her four reflections belong to different categories. She goes from one to the other without a noticeable break in the flow of events.

These five minute periods exhibit several important features of a teacher's reflection-in-action. First, reflective actions occur frequently. Second, a teacher's reflection-in-action requires a great deal of mental energy. Teachers go from one decision to another without much intervening time and without the luxury of true reflection. Their actions must be immediate and appropriate. Therefore, these actions necessitate a wealth of knowledge and quick access to it. Third, teachers operate under a divided attention. While seemingly addressing a particular occurrence, they simultaneously monitor other students and the progression of the lesson as a whole. While overtly dealing with one event, they give partial attention to other students and remain cognizant of the potentiality of other demands. Finally, "action" designates two aspects of a teacher's reflections: (a) they occur while conducting a lesson, and (b) they occur amidst ongoing classroom events. Other professionals may make on the

spot decisions and be mentally drained at the end of a day, but teachers lack the possibility for isolating an event for their undivided attention.

The students

Like their teachers, students enter a classroom with an agenda, a plan to guide their reflective actions. Understanding these intentions makes identifying their reflective actions possible. Therefore, I will first establish their plan and then characterize their reflective decisions.

Student actions and their responses to the question, When you go into your reading or social studies class what do you expect to do?, clarifies their intentions. These students, it seems, intend to comply with assigned tasks. They recognize, however, the impact of the ecological environment on these intentions. As Armando explains, "It's like a quick judgment right there. I just wait and see what happens. Anything could happen. When you go in you try to keep your cool and answer the questions somebody asks you. Basically it's whatever happens when you're in there. That's kind of a hard decision to make before you get in there. You never know what's going to happen."

Student intentions to comply with assigned tasks provide a basis for the decision students most often refer to in their interviews and exhibit in their classroom behavior. Students determine their involvement with a lesson. I call this a compliance continuum. Students comply, renege, or settle upon some point in-between. The decision is theirs. Student responses to the question, "What kinds of decisions do you make during your reading (or social studies) class?", explain the options. Classroom events corroborate their presence.

Students' compliance decisions are not static. Students may begin a lesson adhering to the teacher's plan or straying from it and then change their actions.

Students choosing not to comply usually elect a subtle form of withdrawal. In other words, they adopt a look of compliance. Colin may open his book and look towards the teacher while deciding "whether or not I want to pay attention or be off somewhere else instead of listening." Carol has two ways to withdraw from a lesson. "I usually can't get away with this, but sometimes I just like sit there and stare out the window, but that doesn't really work. She catches me. She sees me sitting there just looking and she knows I'm not doing anything." Therefore, she writes. "If I'm writing, she thinks I'm working."

While it occurs infrequently, students do overtly refuse to comply with lesson demands. Robert provides an example. "Robert ain't going to do nothin'," says Gina. Ms. Hughes talks with Ms. Slate about taking him to In-house School Suspension. "He can read there." "I ain't going to ISS," says Robert. He has an open book in his hands and looks across the room. At the end of class, Ms. Hughes says to Ms. Slate, "We've got to do something about Robert." "You can't make him," replies Ms. Slate. "I know that," agrees Ms. Hughes. Students and teachers realize that compliance decisions are student choices.

Students choosing compliance face additional choices. First, they determine how to complete an assignment. Second, students choose to work alone or with others. Third, students decide whether to volunteer. Students volunteer to answer teacher questions, add information to the topic under consideration, and share personal experiences. Armando expresses the problems volunteers encounter. "You have to make a quick

judgment you have to make in your head- -is the question right? Sometimes you get real nervous before you answer the question in front of everybody. You want to answer it right and not come out in the wrong way. It's embarrassing."

Like their teachers, not all student decisions relate to the plan. Students reflect about their behavior. Some students consider their choices rather simple. Other students experience more internal debate. Armando explains the dilemma. "Basically I just say to myself, 'I'm not going to get in trouble, try to get my work done, and think about what I'm going to say before I say it.' That's what's going to get you in trouble 'cause you say something you don't really mean to say." Some of their decisions violate their sense of right. As Andy explains, "Sometimes I'll just do what she says to avoid getting in trouble." Justin, on the other hand, sometimes behaves inappropriately to "test the teacher. She always says she's the goddess of 1,000 eyes and we try to do as much as we can...It's just the excitement if you'll get caught or not."

Reasons for Reflective Actions

The teachers

One underlying goal guides the reflections teachers make during their lessons. Teachers want to accomplish the learning planned for that day. As Ms. Carson recognizes, the plan initiates "an interaction between youngsters, myself, the book, the answers, vocabulary that they use, the vocabulary I use, the emphasis I put on certain aspects." This section explores the sources of information that Ms. Carson and Ms. Hughes use to guide their reflections about those interactions.

Students are the main source of information. First, these teachers respond to students' facial expressions. Ms. Carson selects individuals to

serve as "barometers." As she explains, "If I connected with the three most cynical ones or the most sophisticated ones or the ones so bright that within the classroom, in the framework of the classroom, they would be the most bored, then I've done a good job for today." Ms. Hughes uses student responses as "measuring sticks." She notices "kids looking puzzled--the puzzled look or asking their friends or just the ones that sit there blank. These things I can pick up."

Second, these teachers use students' oral and written feedback. Ms. Hughes "huddles." "I walk around and see that they're writing stuff that I'm not looking for. I'll say, 'Well, they're not getting what I'm after.' That's when I'll go back and rearrange it so they can get what I want them to get out of the lesson."

In addition to information acquired during class, Ms. Hughes and Ms. Carson consider personal knowledge about their students acquired over time. These teachers develop an understanding about their students which might lead them to modify but not forsake their academic expectations.

Finally, these teachers use their general understandings of the age group. "...I keep a controlled class," says Ms. Carson. "You have to with this age group. You have to keep control. You cannot have the open classroom here--unstructured--because you'd have chaos in three seconds literally." In explaining the digressions that often occur in her classes, Ms. Hughes says, "When they make silly comments, I just let them. A lot of them have a need to have a little power at points so I let them say stuff."

The teachers' and students' moods and personalities form a second category that impacts reflective thought. According to Ms. Carson, "To tell you the truth, it depends upon how I'm feeling that particular moment."

Ms. Hughes thinks the mood of the teacher before class begins is important. For example, events in her first period reading class sometimes leaves her unsettled when social studies class begins. These teachers also respond to the mood of the class. During a lesson, Ms. Carson decides to say something silly because "I remember thinking to myself, 'What's wrong with them? There's no animation.' They're just sitting. They're almost withdrawn from me."

Third, previous events contribute to teacher reflections. Ms. Carson remembers her reactions to Michelle's behavior when the principal was in the room. That remembrance contributes to her reaction during a subsequent lesson. "I was so upset by her behavior from the day before that I just walked over to her and said, 'I am really very upset about your behavior. I don't like it. I want it to stop now.'"

Fourth, time limitations guide their classroom decisions. During the shared viewing, Ms. Carson explains, "Now, I must have looked at the clock and I'm getting a little panicked because I want to finish the study guide that day. I don't want to let any ends dangle." Time considerations also affect the depth of a discussion. On one day, she tells students she wants to go through a series of questions quickly because "we have a lot to do."

Finally, these teachers consider the classroom community. These teachers, over time, aggregate information about the classroom ecology and use this information to guide their reflections during a lesson. In other words, teachers discover the unique classroom culture of each class period and this, in turn, influences their decisions.

The students

As previously explained, a student's decision regarding compliance occurs during a lesson. Several factors contribute to this decision. First, the students' peers influence a decision. As Maria explains, "It depends mostly upon what the other people are doing. If most of the other kids are doing one thing then I'll probably go along with them." Nicole decides to read during class "'cause other people are."

Second, a student's mood affects his or her compliance decisions. Events in and out of the classroom affect the mood. Carl mentions not getting enough sleep or not being able to concentrate as a result of a fight with his brother. Tammy also mentions the importance of home events. Other students don't specify how their moods develop, but recognize their impact on classroom behavior. "If I'm in a good mood," says Colleen, "I'll be interested no matter what it is. I'll be all ears listening to what the teacher's saying. I'll be so happy I'll feel like working and doing what everybody says...If I do my work it makes me feel better. Listening makes me feel better and my day just goes great."

Third, the topic of the lesson and the student's knowledge about it affect their compliance decisions. "It depends on if they're talking about some of the stuff I like," says Chris. Students, like Sereta and Tammy, volunteer when they think they have a correct answer. Carl, who usually doesn't volunteer, chooses to comment when the topic triggers a moral response.

Grades influence student compliance decisions. As Chet explains, "If I'm getting bad grades I'm sure to listen. When I have good grades--see sometimes when I get my grades up high I just figure I got high grades I can just blow off a little time and I'll just sit around." "I need good grades

to get into a college," says Chris. "I can't flunk, that's for sure," says Greg. "I've gotta go to high school."

Finally, the teacher affects their decisions. "I like my teacher," says Karen. "I want to make her see- -she always tells us we're one of her worst classes. I think she's just joking, but I just work a lot harder in that class." Jenny provides another perspective. "I guess I like the way she goes about teaching social studies. She makes it fun...She lets us get in the conversation about things that interest us..."

In determining school behavior, students attempt to avoid reprisals. Maria explains how this works. "I kind of look at what the consequences are--what favors it." Chris provides a specific example. He talks about a teacher who commented about his weight. "I was real mad," he explains. "I just kept my mouth shut and just went on. I could have said something back real bad but I didn't want to get suspended or anything so I just kept my mouth shut."

The Effects of Reflective Actions

A final question to consider is whether teachers' reflective actions promote students' learning. One way to determine this is to compare what students perceive as helpful and what teachers do. This section uses student responses to two questions, What does a teacher do to help you? and What kinds of things does a teacher do to get you to work your hardest?, to determine the students' preferences.

First, most students believe personal interactions increase their classroom success. They most often mention personalizing the plan. Twenty four of the thirty five students interviewed extol the benefits of

personal explanations. Jennifer explains the effects of the personal conversation for the student. "I just think when you go up to ask questions it's just you and her standing there and you can concentrate more on what she's saying than when she's yelling it out to the whole class." Armando recognizes the teacher's difficulty in selecting the right response. "I think she probably tries to come up with the best answer she can. She doesn't want to tell you the wrong thing, but then she doesn't want to put it in terms I wouldn't understand what she's trying to say. I know it's something she has to explain and that there's a more scientific way of putting it than the way you could understand it." Some students, like Tammy, benefit from their peers' explanations. "I'll listen to the other kids talk and then I can understand it," she says. "Most of the time when the other kids talk it's in a way I can understand. That's one of the best ways to understand it."

Students benefit from procedural suggestions. Most often their teacher helps them locate pertinent information. Yolanda offers a reason for its success. "After they show you where to read you read it more than once. You'll get the clue--you'll know how to do it then." Karen describes another way her teacher helps. "If you have to infer something then you have to decide what made those people do that. She'll set the thing up for you and you'll have to figure it out from there." Sometimes, students don't see teacher suggestions as helpful. "They'll tell me to look it up in a dictionary," says Yolanda, "and I'll think, how can I look it up in a dictionary when I don't even know what the word is?"

Finally, students mention the benefits of receiving explicit answers. "She tells me what to do," says Greg. "They'll tell you to erase something and put that in," says Sereta. In addition, students ask how to pronounce and spell words and teachers tell them.

Recall the earlier section on how teachers think about personalizing instruction. They usually offer procedural suggestions. At times, they rephrase original explanations. Less frequently, they provide an answer. These actions coincide in scope with what students perceive as beneficial. They do not match the order of student preferences. Students most often mention explanations as helping them. They perceive procedural suggestions and explicit answers as equally beneficial.

Students' interest affects their classroom performance. Their comments explain how certain interactions increase it. "She'll talk about an experience she's had like when she was with her Asian friends," says Kendra. "She'll put it in story form. She'll make it really interesting." Carol explains more fully. "If they could think of something interesting, like not just tell you the facts of what happened but if they know of something else that's interesting that they can add and fit into the conversation then you get into a discussion about that and you remember things like that because you remember it being interesting." These student preferences coincide with Ms. Hughes' and Ms. Carson's modifications of a planned lesson.

Finally, some students believe classroom success is a solitary accomplishment. As Andy explains, "They ain't going to do nothing. I do it myself. I just get my books and do it." According to Jennifer, "It's okay for them to open up to you and it's kind of interesting to learn more about your teachers, but I don't think that really has a factor over whether I do the social studies."

In short, Ms. Hughes and Ms. Carson create a plan. Their students enter the classroom intending to comply with this plan. These plans and intentions undergo changes as teachers and students respond to external

and internal occurrences. The separate discussions about student and teacher reflections and the reasoning behind them show how students' and teachers' actions affect one another. It is the teachers and students together who create a classroom ecology. The influences on the ecology are complex and varied. They do not connect in a linear, tidy, cause-effect, if-then order. However, teachers and students know when a balance has been achieved. There are key indices. The classroom plan runs smoothly. Students participate enthusiastically in the plan. The reflections of neither students and teachers are compromised; instead they become complementary. The circularity of their reflections envelop the classroom and develop an ecology based on academic pursuits, classroom reflection-in-action.

Discussion

This study confirms and extends previous findings about teachers' interactive decisions. First, Ms. Hughes' and Ms. Carson's collective actions during the implementation of a lesson confirm the categorical findings of McNair (1978-79), Marland (1977) and Morine-Dershimer (1978-79). However, the terms I use stem from their actions and suggest a unitary controlling factor: the way the teachers act on their "planned information." A teacher's planned information includes instructional intentions--what the teacher expects students to learn. For Ms. Carson and Ms. Hughes, the plan is central to their reflections. These teachers' plans affect classroom actions. In turn, classroom actions can impact planning decisions.

Second, while some researchers eliminate classroom routines from interactive decisions (i.e. Shavelson, 1983), routines seem to sometimes warrant inclusion. Ms. Carson and Ms. Hughes select from a variety of

routines in their repertoires. At times, these teachers plan in advance to use a routine. At other times, these teachers judge the appropriateness of a routine as a lesson progresses. In the latter case, the existence of routines as options for actions does not eliminate variability or diversity. Real decisions still must be made. Since they make these decisions during the implementation of a lesson, they qualify as interactive decisions.

Third, previous researchers, like Peterson and Clark (1978), confined teacher reflections to bounded classroom events. I have found a non-bounded feature. In other words, the wider classroom ecology (e.g., the school or the community) triggers reflections and accounts for specific teacher and student actions. At times, the outside players are people like secretaries, principals, or counselors. At other times, this influence embraces previous home or school events. At Gardner, the school's tracking system removes certain groups of students from the flow of classroom actions and affected it. These contextual influences render straightforward interpretation of teacher and student behaviors inadequate.

Unlike previous research, this study includes students' decision-making. Typically, students receive a casual mention or a tangential inclusion. I have tried to let their voices be heard. The findings from students' behaviors and interview responses are important for several reasons. First, they verify the generative nature of classroom actions. A particular teacher or student action is not an isolated occurrence. It is a cultural event. Classroom reflection-in-action is performed by a teacher or student but becomes a joint activity. Therefore, studying reflective actions from a joint perspective enables a complete understanding of classroom reflection-in-action. Second, students' behaviors and comments reveal

their classroom intentions. These middle school students enter a classroom intending to comply. Whether they do depends upon their response to what happens to them. Students control their placement on the compliance continuum. However, the ecological community contributes to the response. Knowing the interactions of the event and what causes an action can foster positive compliance choices. The classroom community needs to recognize student choices and the reasons behind them. In addition, that community needs to create an environment that encourages a commitment to learning.

Next, this study differs from its predecessors in that it tries to understand why teachers and students do what they do. For Ms. Carson and Ms. Hughes, the reasons are very humanistic. However, while based on student behaviors, their interpretations are unchecked. Understanding that these teachers base many of their classroom actions on their interpretations of student actions is important. For students, their moods, the actions of peers, feelings about a teacher, and a desire for good grades influence their reflective actions.

Finally, my research suggests that umbrella topics provide an overly simplistic characterization of decision-making. Ms. Hughes' and Ms. Carson's reflective actions embody attributes of an ill- structured domain, a domain characterized by complexity, irregularity, and breadth (Spiro, Vispoek, Schmitz, Smarapungavan, & Boerger, in press). Establishing categories suggests a sameness and reduces an outsider's understanding of the varying events teachers face. It imposes a structure with a tidiness not really present in classroom life. In other words, in classrooms, the previously used terms do not represent single events with a set of attributes. Reflections occur in a dynamic and complex setting, the classroom.

Imagine a Rubik's cube popularized in the Seventies. Instead of the colored squares, have each square represent a possible action by a student or teacher or the information they might select to inform their action. Instead of a goal of creating solidly colored sides, the goal is to implement a plan designated by the teacher. Implementing the designated plan instigates a student action, a turning square. Each time one square turns, the cube changes. The redefinition of the cube triggers another change and another. Unlike the player of the original game, one individual does not control the movements of the squares. The changes stop when a class period ends or the plan is finalized. At this point the cube becomes a solid object. The intermediary changes represent classroom reflection-in-action. The final representation of the cube represents that day's instantiation of the plan. An accumulation of cubes from my 100 observations would result in 100 different cubes, 100 different final representations of classroom reflection-in-action.

To summarize, previous scholars labeled teachers' interactive decisions. Each label supposedly represented a category of similarly conceived actions (see Table 5). Teacher actions during a lesson were classified and, in some cases, counted. I propose a fuller picture. I also assign categories for teachers, but I include categories for students. I underscore the connections between the categories generated from student and teacher actions. I cite the information sources that inform teacher and student actions (see Table 6). Rather than simply seeing groups of decisions, I assert the uniqueness of the actions within the same group.

I have tried to "operationalize" the differences between my approach and that of my predecessors by selecting a different term to identify what teachers and students do. Classroom reflection-in-action is not used to add

to educational jargon, but to signal a change in the conceptualization of what previous scholars called interactive decisions.

Generalizability is a fragile concept. However, continuities between classrooms often exist. To this extent, perhaps these two representations depict a typicality. With this in mind, perhaps it is safe to say that my description applies to other middle school classrooms, teachers, and students as they construct a plan initially determined by the teacher.

Classroom reflection-in-action deserves additional research. Other research might explore subject area comparisons. Second, additional research might compare reflective practices of teachers at different stages of their careers. In particular, the research might ascertain whether stages of expert knowledge acquisition (Spiro, Jehng, Durgunoglu, McGinley, & Jacobson, 1988) apply to reflection-in-action. Finally, it is important to know whether changes in teacher training affect classroom reflection-in-action.

To recapitulate, this study uses classroom events, student and teacher interviews, and shared viewings of videotaped lessons to characterize classroom reflection-in-action. The findings create categories of reflective actions for students and teachers, offer reasons for these actions, and explore their consequences. Cumulatively, these findings establish the complexity and ecological nature of classroom reflection-in-action.

Table 1

Options for Personalizing a Plan

Teacher & subject	Personalization methods		
	Suggest	Explain	Tell
Ms. Hughes			
Reading	.46	.07	.47
Social studies	.59	.32	.09
Combined	.52	.17	.31
Ms. Carson			
Reading	.64	.27	.09
Social studies	.25	.25	.50
Combined	.48	.26	.26

Note. The values represent proportions of the total number of occurrences.

Table 2

Protocol Episodes

Teacher	Subject	
	Reading	Social studies
Ms. Hughes	92	51
Ms. Carson	54	52

Note: The values represent the total for the 25 observations.

Table 3

Summary of Teachers' Reflective Actions

Plan related	Non plan related
Modify planned events	Adjust environment
Institute a new plan	Address needs
Use a plan sooner	Handle interruptions
Personalize a plan	Respond to red flag
Evaluate	occurrences
Maintain classroom protocol	

Table 4

Summary of Students' Reflective Actions

Plan related	Non plan related
Compliance	Behavior
How?	
With whom?	
Volunteer?	
Noncompliance	
Subtle	
Overt	

Table 5

Classifications of Teachers' Interactive Decisions

Sutcliffe & Whitfield	Management
	Lesson content
	Environmental stimuli
McNair	Pupil
	Lesson content
	Procedures
	Time
	Materials
Marland	Correcting & adjusting the lesson
	Dealing with unpredictable parts of a lesson
	Using principles of teaching
	Adapting instruction to the student

Table 6

Classroom Reflection-in-Action

Plan Related	
Teacher	**Student**
Extending planned information	Compliance continuum
Depth or direction	Compliance
Anecdotes	Reneging
Personal experience	Anticipating a future plan
Current events	Noncompliance
Changing planned information	Activity completion
Exceptions	
Activities	Volunteering
Content	
Personalizing the plan	Seeking help
Suggestions/hints	
Explanations	
Telling	
Evaluation	

Non-plan Related	
Classroom protocol	Classroom protocol
Red flag occurrences	Red flag occurrences
Personal or environmental needs	Personal or environmental needs
Interruptions	Interruptions

Reasons for Responses	
Plan completion	Peer influence
Student responses	Mood and emotions
Mood and personality	Topic
Previous events	Grades
Time limitations	The teacher
Classroom culture	

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